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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

27-017

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on September 19, 2005Signature Vickie IshimaruTyped or printed name Vickie Ishimaru

Application Number

10/825,910

Filed

Apr. 16, 2004

First Named Inventor

Byung Tai Do

Art Unit

2818

Examiner

Tu Tu V. Ho

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

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Registration number

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Registration number if acting under 37 CFR 1.34 _____

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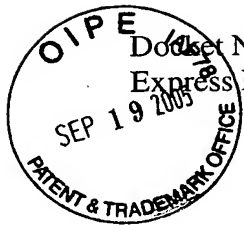
September 19, 2005
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Byung Tai Do, et al. : Confirmation No.: 8877
Serial No.: 10/825,910 : Art Unit: 2818
Filed: 4/16/2004 : Examiner: Tu Tu V Ho
For: THERMALLY :
ENHANCED STACKED
DIE PACKAGE AND
FABRICATION METHOD

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ARGUMENTS IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir/Madam:

The following Arguments are submitted under the Pre-Appeal Brief Conference Pilot Program in response to the Office Action mailed June 17, 2005 (the Final Office Action).

The pending claims 1-20 are set forth in Applicants' Amendment dated May 28, 2005 at pages 2-5 (Paper No. 3.).

ISSUE PRESENTED

Did the Examiner error in an attempt to create a prima facie case of obviousness under 35 U.S.C. §103 by combining references that:

- 1) taken as a whole teach away from the claimed invention;
- 2) do not provide a teaching or suggestion for the purported combination; and
- 3) result in an inoperable device when combined?

Applicants respectfully submit that the Examiner erred in the purported combinations.

ARGUMENT

Claims 1, 2, 5-7, 10-12, 15-17, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akram (U.S. Patent 6,351,028, hereinafter “Akram”, in view of Ho et al. (U.S. Patent 6,507,104, hereinafter “Ho”).

Applicants’ claimed combination in independent claims 1, 6, 11, and 16, as exemplified in independent claim 1, includes the limitation not disclosed in Akram or Ho of a semiconductor package having stacked dies in which:

“the heat sink comprising a body portion, an undercut portion around a periphery thereof, and a plurality of legs integrally formed with the undercut portion”

Applicants agree with the Examiner that Akram:

“...fails to teach that the heat sink includes a plurality of legs integrally formed with the undercut portion of the heat sink, and thus further fails to teach attaching the plurality of legs to the substrate.”

Akram is directed to the packaging of more than one integrated circuit device within a common package. Akram discloses the use of a T-interposer between stacked dies in a package. There is no disclosure or suggestion in Akram that the T-interposer does or could have legs. Akram teaches the use of the vertical portion of the T in contact with a lower die to support the T-interposer. Therefore, Applicants submit that Akram actually teaches away from Applicants’ plurality of legs integrally formed with the undercut portion as claimed.

Ho is directed to a semiconductor package in which one semiconductor chip [31] is packaged with a heat sink [33] attached to the semiconductor chip [31] using solder balls [35]. The Examiner bases the rejection on Ho FIG. 2 (PRIOR ART). However, Ho column 2, lines 1-16, teaches away from using a structure with legs as shown in Ho FIG. 2.

Thus, Akram and Ho teach away from the claimed combination.

Furthermore, Akram teaches a stacked structure but Ho column 2, lines 1-16, teaches that it is not possible to maintain planarity of the flat portion 200. Since planarity is required for stacking dies, Akram with the Ho FIG. 2 heat sink would be inoperative.

Since both Akram and Ho teach away from Applicants' invention, the combination taken as a whole is taught away from, and the combination would be inoperative, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103 because:

"We have noted elsewhere, as a "useful general rule," that references that teach away cannot serve to create a prima facie case of obviousness... If references taken in combination would produce a "seemingly inoperative device", we have held that such references teach away from the combination and thus cannot serve as predicates for a prima facie case of obviousness." *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) [deletion for clarity]

Referring to claims 2, 5, 7, 10, 12, 15, 17, and 20, these dependent claims respectively depend from independent claims 1, 6, 11, and 16 and are believed to be allowable for the reasons set forth above since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Claims 3, 8, 13, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akram in view of Ho, and further in view of Chiu et al. (U.S. Patent 6,437,984, hereinafter "Chiu").

With respect to claims 3, 8, 13, and 18, these dependent claims respectively depend from allowable independent claims 1, 6, 11, and 16 and are believed to be allowable for the reasons set forth above since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

In addition, the Akram T-interposers fully support the overlying die so Akram teaches away from a combination with Chiu FIG. 1B because it is not possible to connect the bond wires to the T-interposers and because the Ho heat sink is exposed for heat transfer, the bond wires would be exposed and rendered inoperative.

Since each of Akram, Ho, and Chiu teach away from Applicants' invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants' invention as required by 35 USC §103 because of *In re Gordon*, *supra*.

Claims 4, 9, 14, and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Akram in view of Ho, further in view of Chiu as applied above (the

‘028/104/984 reference), and further in view of Shin et al. (U.S. Patent 5,854,511, hereinafter “Shin”).

With respect to claims 4, 9, 14, and 19, these dependent claims respectively depend from allowable independent claims 1, 6, 11, and 16 and are believed to be allowable for the reasons set forth above since they contain all the limitations set forth in the independent claims from which they depend and claim non-obvious combinations thereof.

Additionally, Shin is directed to a semiconductor package that has one semiconductor chip and a heat sink [20] is exposed through the molding compound [50]. A combination with a second stacked semiconductor chip attached to the exposed surface of the heat sink [20] would result in an inoperable device because the second semiconductor chip would be outside the semiconductor package. Applicants submit that a combination of references that results in an inoperable device is improper under 35 U.S.C. §103 because of *In re Gordon, supra*.

Since each of Akram, Ho, Chiu, and Shin teach away from Applicants’ invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants’ invention as required by 35 USC §103.

Claims 1, 2, 5-7, 10-12, 15-17 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ho in view of Akram.

Applicants agree with the Examiner that Ho:

“...fails to teach that the package comprises a second die, and thus fails to teach attaching a second die to the heat sink and electrically connecting the second die to the substrate.”

Since both Ho and Akram teach away from Applicants’ invention, it is respectfully submitted that there is no teaching or suggestion to combine the references to arrive at Applicants’ invention as required by 35 USC §103. Accordingly, it is submitted that the Examiner’s reference to a “104/028 device, and the combined teachings of the ‘104/028 reference” is improper and without foundation because of *In re Gordon, supra* (see above with respect to claims 1, 6, 11, and 16).

Claims 3, 8, 13, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ho in view of Akram as applied above (the '104/028 reference), and further in view of Chiu.

Applicants' reiterate their arguments above with respect to the purported Akram combination with Ho and Chiu.

Claims 4, 9, 14, and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ho in view of Akram, further in view of Chiu et al. as applied above (the '104/028/984 reference), and further in view of Shin.

Applicants' reiterate their arguments above with respect to the purported Akram combination with Ho, Chiu, and Shin.

It is respectfully submitted that the Examiner has erred in the purported combination of references where the references:

- 1) taken as a whole, teach away from the claimed invention;
- 2) do not provide a teaching or suggestion for the purported combination; and
- 3) result in an inoperable device when combined

In view of the above, it is submitted that claims 1-20 are in condition for allowance and such action at an early date is solicited.

Respectfully submitted,



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